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Part 4

THE NATIONAL GROUND WATER RESEARCH AND PROTECTION ASSISTANCE ACT OF 1987

SEPTEMBER 30, 1987.—Ordered to be printed

Mr. ROE, from the Committee on Science, Space, and Technology, submitted the following

REPORT

[To accompany H.R. 791]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 791) to authorize water resources research activities of the U.S. Geological Survey, and for other purposes, having considered the same, report favorably thereon with amendments and recommend that the bill, as amended do pass.

CONTENTS

	Page
Amendments	1
I. Purpose of the bill	10
II. Committee actions	11
III. Background and need for the legislation	11
IV. Explanation of the bill	21
V. Sectional summary of the bill	35
VI. Congressional Budget Act information	37
VII. Congressional Budget Office cost estimate	37
VIII. Oversight Findings and Recommendations, Committee on Government Operations	39
IX. Effect of legislation on inflation	39
X. Committee recommendation	39

The amendments are as follows:

Strike out all after the enacting clause and insert the following text:

SECTION 1. SHORT TITLE AND TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "National Ground Water Research and Protection Assistance Act of 1987".

(b) TABLE OF CONTENTS.—

Sec. 1. Short Title and Table of Contents.
Sec. 2. Findings.
Sec. 3. Definitions.

H703-12

Sec. 4. Purposes.
Sec. 5. Coordination of Federal Interagency Ground Water Research Programs.
Sec. 6. National Groundwater Assessment Program.
Sec. 7. National Research, Development, and Demonstration Program for Ground Water Protection and Management.
Sec. 8. Ground Water Contaminant Risk Assessment Analysis Program.
Sec. 9. Technical Assistance, Training, and Technology Transfer.
Sec. 10. National Ground Water Information Clearinghouse.
Sec. 11. Environmental Protection Agency Ground Water Research Capability Improvements.
Sec. 12. Peer Review.
Sec. 13. Authorization of Appropriations.

SEC. 2. FINDINGS.

The Congress finds that—

(1) Ground water is a resource of immeasurable value, comprising 86 percent of the fresh water available for use in the United States.

(2) Ground water supplies approximately one-half of the Nation and 90 percent of the Nation's rural population with drinking water, and over one-half of the Nation's irrigation water.

(3) Ground water contamination has occurred in every State in the Nation and is being detected with increasing frequency.

(4) Sources of ground water contamination are diverse, including those naturally occurring, waste and nonwaste products and activities, point and non-point sources, and hazardous and non-hazardous substances.

(5) Certain ground water contaminants are associated with adverse health, environmental, economic, and social impacts.

(6) While the Federal Government has certain responsibilities for the protection, maintenance, and restoration of ground water quality, under existing laws, the primary responsibility for ground water protection, maintenance, and restoration is with States and local governments.

(7) The Federal Government should conduct research, disseminate information, and provide technical assistance to support State ground water programs, but presently lacks a clear and comprehensive statutory mandate to conduct such activities.

(8) Current Federal research, data collection, and information dissemination efforts in ground water are not adequately coordinated and do not provide adequate assistance for States and local governments to protect and manage ground water resources.

(9) Although considerable scientific progress has been made in knowledge about ground water resources and ground water contamination, including the transport, transformation, and fate of ground water contaminants and the effects of ground water contamination on human health and the environment, there remain significant gaps in developing and making available such needed scientific knowledge.

(10) Presently available technologies to detect, monitor, and mitigate ground water contamination are expensive and highly limited in utility.

(11) Shortage exist in skilled personnel trained in scientific disciplines relevent to the detection, assessment, prevention, and restoration of contaminated ground water resources.

(12) The scientific uncertainties, lack of adequate technologies, and shortage of skilled scientific personnel hinder the ability of Federal agencies, States, and local governments to develop and implement policies to protect and manage ground water resources.

(13) Ground water contamination should be prevented rather than relying on expensive clean up efforts.

(14) Greater efforts are necessary to prevent ground water contamination today and to protect this valuable resource for current and future generations of Americans.

SEC. 3. DEFINITIONS.

As used in this Act—

(1) The term "Administrator" means the Administrator of the Environmental Protection Agency.

(2) The term "Agency" means the Environmental Protection Agency.

(3) The term "assessment", when used with respect to ground water or ground water resources, means to describe the location, geological properties, quantity, and quality of such resources.

(4) The term "contaminant" means any naturally occurring or manmade chemical, physical, radiological, or biological substance or matter in ground water.

(5) The term "contamination" means the presence of any contaminant in ground water.

(6) The term "Federal agency" means any department, agency, or other instrumentality of the Federal Government, including any Government corporation.

(7) The term "ground water" means water below the land surface in the zone of saturation.

(8) The term "local government" means any city, town, borough, county, parish, district, or other public body which is a political subdivision of a State and which is created pursuant to public law.

(9) The term "nonprofit organization" means any organization, association, or institution described in section 501(c)(3) of the Internal Revenue Code of 1986 which is exempt from taxation pursuant to the provisions of section 501(a) of such Code.

(10) The term "person" means an individual, trust, firm, joint stock company, corporation (including government corporation), partnership, association, consortium, joint venture, State, local government, commission, regional agency, interstate agency, or Federal agency.

(11) The term "Secretary" means the Secretary of the Department of the Interior.

(12) The term "source" means any structure, activity, or operation which has the potential to contaminate ground water.

(13) The term "State" means any of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

SEC. 4. PURPOSES.

The purposes of this Act are—

(1) to establish a comprehensive and coordinated program of research, development, and demonstration within the Federal Government to enhance the knowledge of the natural characteristics and processes that govern ground water, and to improve the scientific capability to assess, detect, and evaluate the effects on human health and environmental resources of ground water contaminants;

(2) to provide incentives for the development and dissemination of technologies for preventing, detecting, and mitigating ground water contamination;

(3) to authorize ground water research and technical assistance programs at the Environmental Protection Agency and the United States Geological Survey;

(4) to enhance the internal ground water research capabilities of the Environmental Protection Agency;

(5) to improve the knowledge of ground water quality conditions and trends;

(6) to provide for technology transfer, technical assistance, and research information dissemination to other Federal agencies, States, and local governments, for the purpose of assisting them in monitoring, protecting and managing ground water resources and in meeting their responsibilities under existing law; and

(7) to provide training in scientific disciplines relevant to ground water contamination research.

SEC. 5. COORDINATION OF FEDERAL INTERAGENCY GROUND WATER RESEARCH PROGRAMS.

(a) INTERAGENCY GROUND WATER RESEARCH COMMITTEE.—The President shall provide for the coordination of research, development, demonstration, technology transfer, training, and information dissemination activities with respect to ground water quality conducted by Federal agencies through the establishment of an Interagency Ground Water Research Committee. Such Committee shall be established within 90 days from the enactment of this Act. The membership of such Committee shall include a representative of each Federal agency involved in ground water related activities, and shall, at a minimum, include the Environmental Protection Agency, the U.S. Geological Survey, the Department of Agriculture, and the Department of Health and Human Services. The Committee shall be co-chaired by the U.S. Geological Survey and the Environmental Protection Agency and shall hold at least two public meetings per year.

(b) DUTIES.—The Interagency Ground Water Research Committee shall:

(1) identify major research data needs and scientific uncertainties regarding ground water characterization, monitoring, protection, management, and restoration;

(2) develop overall priorities and a coordinated research plan for addressing the data needs and scientific uncertainties identified;

(3) otherwise facilitates, through joint funding and other means, interagency cooperation and coordination on ground water research, development and demonstration programs; and

(4) consult with State and local governments, environmental organizations, scientific and professional organizations, industry, academia and other appropriate institutions to determine the ground water research and information needs of State and local governments and other persons who have responsibilities for protecting or managing ground water resources.

(c) BIANNUAL REPORT.—The Interagency Ground Water Research Committee shall make a biannual report summarizing the major research issues concerning the characterization, protection, management, and restoration of ground water resources, describing the research accomplishments of the preceding 2 fiscal years, and outlining the ground water research program for the member Agencies for the 2 succeeding fiscal years. The report shall also include a discussion of the ground water needs of State and local governments. The report shall be submitted to Congress not later than January 15 of every other year beginning in 1989.

(d) AGREEMENTS.—Each member agency of the Interagency Ground Water Research Committee shall enter into agreements and/or memoranda of understanding with the other members of the Interagency Ground Water Research Committee detailing the responsibilities of each entity in order to avoid duplication of efforts.

SEC. 6. NATIONAL GROUND WATER ASSESSMENT PROGRAM.

(a) DUTIES OF THE SECRETARY.—The Secretary shall be the lead Federal official for the purposes of conducting the National Ground Water Assessment Program described in this section. All activities of the Secretary described in this section shall be carried out in consultation and coordination with the Interagency Ground Water Research Committee.

(b) ASSESSMENT REPORT.—The Secretary shall prepare a report which includes each of the following—

(1) An assessment of existing ground water quality and quantity information systems, including a description of geographic areas and categories of data where insufficient quality and quantity information is available.

(2) An evaluation of the extent to which existing ground water data collection and monitoring programs conducted by Federal, State, and local governments and private industry are adequate for projecting long term status and trends in ground water contamination.

(3) An evaluation of the availability and accessibility of existing ground water data to Government agencies, organizations, and individuals.

(4) Recommendations on actions to be taken to better utilize existing information and recommendations for the improved collection of data and information.

(c) REPORT REQUIREMENTS.—The Secretary shall complete a draft of the report referred to in subsection (b) no later than 270 days after the date of enactment of this Act. Such report shall then be made available to the Interagency Ground Water Research Committee and the public for a comment period of at least 45 days. The final report shall be submitted to Congress and made available to the public no later than one year after the date of enactment of this Act.

(d) ESTABLISHMENT OF PROGRAM.—Consistent with the priorities established by the Interagency Ground Water Research Committee, the Secretary shall establish and conduct a national ground water assessment program to assist Federal, State, and local governments in assuring that they have the data and information to characterize ground water resources for the purposes of protecting and managing ground water resources and meeting their responsibilities under law. The Secretary shall insure access to data and information by Federal, State, and local agencies, private organizations, and individuals.

(e) ELEMENTS OF PROGRAM.—In conducting the program authorized by this section, the Secretary shall ensure that the program—

(1) assists State and local governments in the assessment of ground water resources and the design of ground water monitoring programs;

(2) provides information regarding protocols and quality controls, recommends valid protocols to be used where appropriate, and provides guidance regarding the comparison of data collected under different methods and quality assurance programs;

(3) encourages the use of existing Federal-State programs, such as the Federal/State cooperative program;

(4) includes research which improves the scientific knowledge and understanding of the nature and extent of ground water contamination, including contamination on a site specific basis; and

(5) provides information and data which will complement the collection of surface water quality data to provide an integrated knowledge of water quality conditions within specific hydrologic regions and subregions.

(f) AUTHORITY TO OBTAIN INFORMATION.—For the purpose of carrying out the activities authorized in subsection (e)(5), the Secretary is authorized to obtain any ground or surface water quality information in the possession of Federal agencies or State and local governments to the extent that such information is obtainable under Freedom of Information Act, copyright, and confidential business information provisions of existing law as administered by such agencies and State and local governments.

(g) PROTOCOLS.—In carrying out the activities authorized by subsection (e)(2), the Secretary shall develop such protocols jointly with the members of the Interagency Ground Water Research Committee, and also provide public notice and solicit comment upon the proposed protocols. Such recommended valid protocols shall not be construed to alter the authority of Federal agencies and State and local governments to determine where the use of such protocols is appropriate. Such recommended valid protocols shall not be construed as being binding or retroactive, and shall not be construed to apply to or impair the use of any other valid protocols in any enforcement proceeding.

SEC. 7. NATIONAL RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAM FOR GROUND WATER PROTECTION AND MANAGEMENT.

(a) DUTIES OF ADMINISTRATOR.—The Administrator shall be the lead Federal official for the purposes of carrying out the National Research, Development, and Demonstration Program for Ground Water Protection and Management described in this section. All activities of the Administrator described in this section shall be carried out in consultation and coordination with the Interagency Ground Water Research Committee.

(b) ESTABLISHMENT OF PROGRAM.—The Administrator shall establish a research, development, and demonstration program to support the Agency's regulatory responsibilities under existing law and to assist State and local governments in the protection, management, and restoration of ground water resources. Such program shall include conducting research, investigations, experiments, demonstrations, surveys, and studies relating to the sources, causes, effects, extent, prevention, detection, monitoring, and mitigation of ground water contamination, and the development and demonstration of effective, practical, and cost-efficient technologies for the prevention, detection, remediation, and mitigation of ground water contamination. For the purposes of this section, "technologies" includes processes, practices, methods, and products.

(c) DEMONSTRATION PROGRAM.—The Administrator shall carry out a program to develop and demonstrate technologies which may be effective in controlling sources or potential sources of ground water contaminants or in mitigating ground water contamination. Consistent with the priorities identified by the Interagency Ground Water Research Committee, the Administrator shall develop and publish a list of priority needs with respect to source control technologies or mitigation technologies. The Administrator may enter into contracts or cooperative agreements, with, or provide financial assistance in the form of grants to, public agencies and authorities, nonprofit institutions and organizations, or other persons, for projects to demonstrate such technologies, only if the Administrator makes each of the following findings:

(1) The project involved will serve to demonstrate a new or significantly improved technology or the feasiblility and cost effectiveness of an existing but unproven technology.

(2) The project involved will not duplicate other Federal, State, local, or commercial efforts to demonstrate such technology.

(3) The demonstration of such technology will comply with all other laws for the protection of human health, welfare, and the environment.

(4) In the case of a contract or cooperate agreement, such technology would not be demonstratd by State, local, or private persons, or, in the case of a grant, such technology is not likely to receive adequate financial assistance from other sources.

(5) The project involved would meet a priority need previously identified by the Administrator.

(6) The project involved is not an "alternative or innovative treatment technology" eligible for demonstration assistance under Section 311(b)(5) of the Comprehensive Environmental Response, Compensation and Liability Act, as amended.

(d) DEMONSTRATION PROGRAM ELEMENTS.—The demonstration program established by this section shall include solicitations for demonstration projects; selection of suitable demonstration projects from among those proposed; supervision of such demonstration projects; and evaluation of the results of the demonstration projects which are conducted. The Administrator shall publish regulations to assure the satisfactory implementation of each element of the program established by this section.

(e) SOLICITATION FOR DEMONSTRATION PROGRAMS.—Within 270 days after the date of the enactment of this Act, and no less often than every 12 months thereafter, the Administrator shall publish a solicitation for proposals for projects to demonstrate technologies which may be effective in controlling sources or potential sources of contaminants or in mitigating ground water contamination. The solicitation notice shall prescribe the information to be included in each such proposal which shall permit the Administrator to assess the potential effectiveness and feasibility of the technology proposed to be demonstrated.

(f) APPLICATIONS FOR DEMONSTRATION PROJECTS.—Any person (including any public or private nonprofit entity) may submit an application to the Administrator in response to a solicitation under subsection (e). The application shall contain a demonstration plan setting forth how and when the proposed project is to be carried out and such other information as the Administrator may require.

(g) DEMONSTRATION PROJECT SELECTION.—Selecting technologies to be demonstrated, the Administrator shall fully review the applications submitted and shall evaluate each project on the basis of each of the following:

(1) The potential of the proposed technology effectively to control or mitigate sources or potential sources of contaminants, with emphasis upon those sources of contaminants which present the greatest risk to human health and the environment or the greatest likelihood of ground water contamination and which are not effectively controlled by existing technologies.

(2) The capability of the person or persons proposing the project to complete successfully the demonstration as described in the application and to make the benefits of the technology widely available to the public in a timely manner.

(3) The likelihood that the demonstrated technology would have significant application.

The Administrator shall select, request further information, or refuse to select a project for demonstration under this section within 135 days after receiving the completed application for such project. In the case of a refusal to select a project, the Administrator shall notify the applicant within such 135-day period of the reasons for the refusal. In each 12-month period the Administrator shall select at least 10 demonstration projects for support according to the provisions of this section.

(h) SUPERVISION AND TESTING.—Each demonstration project under this section shall be performed under the supervision of the Administrator. The Administrator shall ensure appropriate testing procedures, quality control, monitoring, and other measurements necessary to determine and evaluate the results of the demonstration project, and may pay the costs associated with such requirements.

(i) COST SHARING.—In providing financial assistance under this section to a demonstration project, the Administrator shall endeavor to enter into agreements and make other arrangements for maximum practicable cost sharing with other Federal, State, and local agencies, private persons, or any combination thereof.

(j) DEMONSTRATION OF COMPLIANCE.—In making the required finding of compliance in subsection (c)(3), the Administrator shall, after notice and opportunity for public comment, establish guidelines and procedures for issuing expedited demonstration permits or other regulatory approvals required to carry out such research or demonstration.

SEC. 8. GROUND WATER CONTAMINANT RISK ASSESSMENT ANALYSIS PROGRAM.

(a) DUTIES OF THE ADMINISTRATOR.—The Administrator shall be the lead Federal official for the purposes of preparing the Ground Water Contaminant Risk Assessment Analyses required by this section. All activities of the Administrator described in this section shall be carried out in consultation and coordination with the Interagency Ground Water Research Committee.

(b) GROUND WATER RISK ASSESSMENT ANALYSES.—The Administrator shall conduct and publish a risk assessment analysis for each significant ground water contaminant. Such risk assessment analysis shall use scientifically-sound methodologies to assess the risk to human health and the environment associated with a range of concentrations of the ground water contaminant.

(c) CONTENT OF ANALYSES.—Each assessment analysis shall include:

(1) the most recent scientific knowledge on the physical, chemical, biological, and radiological properties of the contaminant and its effect on human health and the environment;

(2) an assessment of factors, including contaminant sources, variable aquifer conditions, and ground water use, which may influence the effect of the contaminant on human health and the environment;

(3) an assessment of the assumptions, scientific uncertainties and data gaps contained in the risk assessment analysis; and

(4) a comparison of the risk posed by such contaminants to risks posed by other ground water contaminants.

(d) FORMAT.—The Administrator shall establish and use a standard format for the representation of the risk assessment analyses to facilitate the use of such analyses by State and local officials and the public.

(e) USE OF AVAILABLE DATA AND AUTHORITY TO CONDUCT ADDITIONAL STUDIES.—In carrying out this section, the Administrator shall use, to the fullest extent practicable, existing data or analysis developed by other agencies, including the Department of Health and Human Services. The Administrator shall also consider data and analysis developed pursuant to the Federal Water Pollution Control Act, the Safe Drinking Water Act, the Toxic Substances Control Act, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, the Superfund Amendments and Reauthorization Act of 1986, and the Federal Insecticide, Fungicide and Rodenticide Act. The Administrator may conduct such additional studies under the authorities of such Acts, in particular sections 4 and 8 of the Toxic Substances Control Act, to gather data necessary to reduce scientific uncertainties in the risk assessment analyses. Such additional studies may be conducted in consultation with the Department of Health and Human Services.

(f) TIMETABLE FOR PUBLICATION OF RISK ASSESSMENT ANALYSES.—The Administrator shall publish, with an opportunity for public notice and comment, risk assessment analyses for not less than 30 contaminants within 24 months after the date of enactment of this Act, and not less than 30 additional contaminants within 36 months after the date of enactment of this Act. Such contaminants shall be selected in consultation with the Interagency Ground Water Research Committee. The Administrator shall continue to publish such analyses for additional contaminants at a rate which is consistent with the needs of the State and local governments in developing ground water quality standards.

(g) PERIODIC REVIEW AND REVISION.—The Administrator shall periodically review and revise, with an opportunity for public notice and comment, published risk assessment analyses to ensure that they reflect developments in scientific data relevant to the contaminant.

SEC. 9 TECHNICAL ASSISTANCE, TRAINING AND TECHNOLOGY TRANSFER.

(a) DUTIES OF ADMINISTRATOR AND SECRETARY.—The Administrator and the Secretary shall carry out the Technical Assistance and Training Program provisions set out in this section. Consistent with sections 5, 6, and 7 of this Act, the Secretary shall be the lead Federal official for the activities under this section for ground water assessment; the Administrator shall be the lead Federal official for the activities under this section for source controls, mitigation methods, and health and environmental effects. The Administrator and the Secretary shall carry out such activities in consultation and coordination with the Interagency Ground Water Research Committee.

(b) ASSISTANCE.—The Secretary and the Administrator are authorized and directed to establish a program to provide technical assistance between and among Federal agencies, and to State and local governments, through grants, loans, cooperative agreements, and contracts. Such technical assistance shall assist in the conduct of activities authorized under this Act and in the collection, evaluation, and analysis of ground water data and information to assist such agencies and governments to assess, manage, monitor, protect, and remediate ground water resources.

(c) RESEARCH AND SURVEYS.—In the course of carrying out this Act, the Secretary and the Administrator may conduct research and make surveys concerning any specific problem of ground water contamination in cooperation with any State. The Federal share of the costs of such research and survey shall not exceed 50 percent.

(d) TRAINING.—In the course of carrying out this Act, the Administrator and the Secretary are authorized to conduct training, for personnel from Federal agencies, States, local governments, nonprofit organizations, and other persons, relating to the causes, effects, extent, prevention, detection, and mitigation of ground water contamination. The Administrator and the Secretary may establish reasonable fees for such training provided to non-Federal personnel.

(e) TECHNOLOGY TRANSFER.—The Administrator and the Secretary shall conduct a technology transfer program, including the collection and dissemination of information obtained by the activities authorized by this Act. Such technology transfer shall be accomplished by, but not be limited to, publications, conferences, and other appropriate means, and by ensuring that such information is available through the National Ground Water Clearinghouse established under section 10.

(f) PUBLIC ACCESS.—Information obtained by the programs authorized by this Act shall be made available to the public, subject to the provisions of section 552 of title 5, United States Code, and section 1905 of title 18, United States Code, and to other government agencies in a manner that will facilitate its dissemination; except that, upon a showing satisfactory to the Administrator or the Secretary by any person that records, reports, or information, or particular parts thereof (except data on discharges), to which the Administrator or Secretary has access under this section, would, if made public, divulge methods or processes entitled to protection as trade secrets of such person, the Administrator or Secretary shall treat such record, report, or information or particular portion thereof as confidential in accordance with section 1905 of title 18, United States Code.

SEC. 10. NATIONAL GROUND WATER INFORMATION CLEARINGHOUSE.

(a) DUTIES OF THE SECRETARY.—The Secretary shall be the lead Federal agency for the purpose of carrying out the National Ground Water Information Clearinghouse set out in this section. All activities of the Secretary set out in this section shall be carried out in consultation and coordination with the Interagency Ground Water Research Committee.

(b) NATIONAL GROUND WATER CLEARINGHOUSE.—The Secretary is authorized and directed to establish within one year after the date of enactment of this Act a National Ground Water Clearinghouse. The objective of such clearinghouse shall be to catalog and disseminate ground water quality and quantity information, and appropriate surface water quality and quantity information, which will enable Federal agencies, State and local governments, and private organizations and individuals to prevent ground water contamination and manage ground water resources.

SEC. 11. ENVIRONMENTAL PROTECTION AGENCY GROUND WATER RESEARCH CAPABILITY IMPROVEMENTS.

(a) AUTHORITIES.—For the purposes of carrying out this Act, the Administrator is authorized—

(1) to enter into contracts or cooperative agreements with, or make grants to, States, local governments, other appropriate public agencies and authorities, nonprofit organizations, and other persons, without regard to section 3709 of the Revised Statutes (41 U.S.C. 5) and section 3324 of title 31, United States Code, for the purposes of this Act;

(2) to construct and equip such facilities as may be necessary; and

(3) to use, on a reimbursable basis, facilities and personnel of existing Federal scientific laboratories and research centers.

(b) RESEARCH COMMITTEE.—In carrying out this Act, the Administrator shall establish a media-specific research committee for ground water resources in addition to the media-specific research committees already established. The membership of the committee established pursuant to this subsection shall be broadly representative of the program and research concerns within the Agency related to the protection, maintenance, and restoration of ground water resources.

(c) SCIENCE ADVISORY BOARD.—

(1) CONTINUING REVIEW.—In addition to such other duties as may be prescribed by the Administrator under this Act, the Science Advisory Board established under the Environmental Research, Development, and Demonstration Act of 1978 (42 U.S.C. 4365) shall review on a continuing basis the ground water research programs of the Environmental Protection Agency and submit periodic reports to Congress. The reports should include, but not be limited to, an evaluation of the progress made by the proposed research program of the Agency, the likelihood that the research program will provide the information needed for pending policy decisions or for State and local governments, and the adequacy of resources to carryout the research program.

(2) COMMENT.—The Administrator shall request comments from the Science Advisory Board on the risk assessment analyses prepared by the Administrator under section 8 of this Act. The Board shall respond, as it deems appropriate, within the time period applicable for the publication of the risk assessment analyses. This subsection shall under no circumstances be used to delay the final publication of ground water risk assessment analyses.

(d) FELLOWSHIPS.—The Administrator is authorized to establish and maintain research fellowships in the Agency and at public or nonprofit private educational institutions or research organizations for the purposes stated in this Act.

(e) RESEARCH INSTITUTES.—

(1) GRANT PROGRAM.—The Administrator shall make grants to institutions of higher learning or other research institutions (or consortia of such institutions) to establish and operate ground water research institutes in the United States.

(2) RESPONSIBILITIES OF THE INSTITUTES.—The responsibility of each ground water research institute established under this section shall include, but not be limited to, the conduct of research and training relating to the protection, maintenance, and restoration of ground water resources and the publication and dissemination of the results of such research.

(3) APPLICATIONS.—Any institution of higher learning or other research institution (or consortium of such institutions) interested in receiving a grant under this section shall submit to the Administrator an application in such form and containing such information as the Administrator may require by regulation.

(4) SELECTION CRITERIA.—The Administrator shall select recipients of grants under this section on the basis of the following criteria:

(A) Each research institute shall be located in a State or region of a State which makes significant use of ground water to meet drinking water, agricultural, o other needs.

(B) Each research institute shall, to the extent practicable, be located in an area which has experienced significant ground water contamination or depletion problems.

(C) Each research institute shall have available for carrying out this section demonstrated research resources.

(D) Each research institute shall have the capability to provide leadership in making national and regional contributions to the solution of both long range and immediate ground water contamination problems.

(E) Each research institute shall make a commitment to support ongoing ground water research programs with budgeted institutional funds.

(F) Each research institute shall have an interdisciplinary staff with demonstrated expertise in ground water management and research.

(5) AGENCY SHARE.—The grant or grants made by the Administrator under this section with respect to the establishment and operation of a ground water research institute shall not exceed 75 percent of the costs of establishing and operating such institute and of the related activities carried out by the grant recipient or recipients.

(6) LIMITATION ON USE OF FUNDS.—No funds made available to carry out this section shall be used for the acquisition of real property (including buildings) or the construction or substantial modification of any building.

(7) EQUITABLE DISTRIBUTION.—The Administrator shall equitably allocate the funds made available to carry out this section among the regions of the United States. One of the institutes shall be the National Center for Ground Water Research, a consortium between Oklahoma University, Oklahoma State University, and Rice University.

(8) TECHNOLOGY TRANSFER.—Not less than 20 percent of the funds made available to carry out this section for any fiscal year shall be available to carry out technology transfer activities.

(9) PROPOSED RESEARCH PROGRAM.—Prior to and as a condition of the receipt each year of funds appropriated to carry out this section, each research institute established under this section shall submit to the Administrator for approval a ground water research program that includes assurances, satisfactory to the Administrator, that such program was developed in consultation with the States, local governmental entities, and other agencies and institutions within the region having ground water protection or management responsibilities and with interested members of the public. Such program shall include plans to promote research, training, information dissemination, and other activities meeting the needs of the region and the Nation, and shall encourage regional cooperation among institutions in research into areas of ground water protection, maintenance, and restoration that have a regional or national character.

(10) REVIEW AND EVALUATION.—

(A) PROCEDURES.—The Administrator shall establish procedures for a careful and detailed evaluation of each research institute to determine whether the quality and relevance of its ground water resources research and its effectiveness as an institution for planning, conducting, and arrang-

ing for such research warrants its continued support under this section in the national interest.

(B) EVALUATION.—The Administrator shall arrange for each of the research institutes supported under this section to be evaluated within two years after its establishment and to be reevaluated at intervals not to exceed five years. If, as a result of any such evaluation, the Administrator determines that a research institute does not qualify for further support under this section, then no further grants to such institute may be made until its qualification is reestablished to the satisfaction of the Administrator.

SEC. 12. PEER REVIEW.

Except as otherwise provided in this Act, studies, reports, and results of research conducted under this Act shall be reported and adopted only after appropriate peer review.

SEC. 13. AUTHORIZATION OF APPROPRIATIONS.

In addition to such sums as may be otherwise authorized, there are hereby authorized to be appropriated to the Environmental Protection Agency for the purposes of carrying out the provisions of this Act $3,000,000 for fiscal year 1988, $6,300,000 for fiscal year 1989, and $9,900,000 for fiscal year 1990.

Amend the title so as to read as follows:

To establish and coordinate within the Federal Government a comprehensive program of environmental research, development and demonstration to assist in the protection and management of ground water resources.

I. PURPOSE OF THE BILL

The purposes of the bill, as reported with amendments by the Committee, are:

(1) to establish a comprehensive and coordinated program of research, development, and demonstration within the Federal Government, to enhance the knowledge of the natural characteristics of and processes that govern ground water, and to improve the scientific capability to assess, detect, and evaluate effects on human health and the environmental resources of ground water contaminants;

(2) to provide incentives for development and dissemination of technologies for preventing, detecting, and mitigating ground water contamination;

(3) to authorize ground water research and technical assistance programs at the Environmental Protection Agency (EPA) and the United States Geological Survey (USGS);

(4) to ehance EPA's internal ground water research capabilities;

(5) to improve the knowledge of ground water quality conditions and trends;

(6) to provide for technology transfer, technical assistance, and research information dissemination to other Federal agencies, States, and local governments, for the purpose of assisting them in monitoring, managing and protecting ground water resources and in meeting their responsibility under existing law; and

(7) to provide training in scientific disciplines relevant to ground water contamination research.

A summary of the appropriation authorized in the bill follows:

FY1988	$3,000,000
FY1989	6,300,000
FY1990	9,900,000

II. COMMITTEE ACTIONS

On June 17, 1987, H.R. 791 was reported by the House Committee on Interior and Insular Affairs and sequentially referred to, among others, the Committee on Science, Space, and Technology, until September 30, 1987. On July 21, 1987, the Subcommittee on Natural Resources, Agriculture Research, and Environment held hearings on H.R. 791 and a related bill, H.R. 2253. Testimony was received from Administration and public witnesses.

On September 16, 1987, the Subcommittee considered and ordered reported H.R. 791, with an amendment in the nature of a substitute offered by Chairman Scheuer, to the full Committee for further consideration. H.R. 791 was considered and ordered reported, as amended, by the Committee on Science, Space, and Technology on September 29, 1987.

III. BACKGROUND AND NEED FOR THE LEGISLATION

A. Ground Water Contamination

Ground water—water drawn from underground formations called aquifers—currently provides nearly one-fourth of the nation's fresh water consumption.[1] The major use is for agricultural irrigation, which accounts for about 80 percent of the ground water withdrawn. But ground water is also used extensively for drinking water. Indeed, almost all rural households (97 percent), and nearly half the total U.S. population, use ground water from wells as the source of drinking water.[2] Ground water also supplies about one-fourth of the water used by industry. Demand for ground water is growing, with the amount withdrawn tripling over the last 30 years to a total of 88 billion gallons per day in 1980.[3]

While the supply of ground water is vast—estimated at 50 times the volume of the nation's surface water—scientists and policymakers alike have learned, contrary to prior assumptions, that ground water is a vulnerable, finite resource that can be degraded by careless management. In particular, the discovery in the last ten years of incidents of ground water contamination by man-made toxic chemicals has raised concern about the quality of the nation's ground water resources. Since ground water moves slowly (usually between 10 and 100 meters per year), aquifers lack the capacity to clean themselves quickly from contaminants. Instead, concentrated plumes of contamination disperse and mix slowly in ground water. Clean up, even when feasible, is highly expensive.

Contaminants in ground water are associated with a wide range of human health effects, from cancer to gastrointestinal disturbances. When drinking water supplies are closed because of contamination, communities frequently incur significant expenses in providing alternative sources of drinking water. Industrial and agricultural users also face significant expenses in finding alternatives to depleted or contaminated ground water.

In some areas of the country, ground water is being depleted faster than it can be recharged by precipitation; in essence, the

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[1] U.S. Geological Survey, *National Water Summary 1984* at 120 (1985).
[2] Ibid.
[3] U.S. Geological Survey, *Estimated Use of Water in the United States in 1980* at 47 (1983).

ground water is being "mined". While a decrease in the quantity of available ground water is in and of itself a major concern with significant economic consequences, depletion also affects ground water quality. Ground water depletion often increases natural contamination by increasing salinity or mineral content in the remaining ground water. For example, in coastal areas, salt water may begin intruding on aquifers that were previously sources of fresh water.

The sources of ground water contamination are diverse. Wastes disposed on land can percolate through the soil, introducing toxic chemicals and other contaminants into the aquifer. The widespread use of land disposal practices, including surface impoundments, septic systems, landfills, uncontrolled hazardous waste sites, and underground injection wells, poses a significant risk of ground water contamination.

Surface Impoundments.—In 1983, EPA identified over 180,000 liquid waste impoundments across the country, containing or treating an estimated 130 million metric tons of hazardous wastes. EPA estimated that fully 93 percent of the impoundments surveyed had an intermediate or high potential to contaminate ground water.[4]

Septic Systems.—About one-fourth of homes in the U.S. use on-site waste disposal for residential sewage, such as septic systems. Up to one-third of these systems may be functioning improperly. Ground water contamination from septic systems has been reported in California, Massachusetts, New York, Florida, Delaware and Connecticut.[5] In addition to contaminating ground water with nitrates and biological pathogens, such systems also can introduce toxic chemicals which have been dumped down the drain.

Landfills.—There are an estimated 75,000 industrial and 20,000 municipal sanitary landfills, most of which contain no liners to reduce the threat to ground water. Many landfills also contain significant quantities of household hazardous waste.[6]

Uncontrolled hazardous waste sites.—In 1986, EPA estimated that there were over 25,000 uncontrolled hazardous waste sites in the country; as of May, 1987, 951 were on the National Priorities List (NPL) of the Superfund program. EPA has documented ground water contamination at 75 percent of the NPL sites.[7]

Underground injection wells.—Underground injection wells are used to inject wastes deep into the earth beneath usable ground water supplies. In 1983, nearly 60 percent of all hazardous wastes regulated under the Resource Conservation and Recovery Act—some 11.5 billion gallons—were disposed of through 200 deep injection wells.[8] Oil and gas producers also use deep injection wells to

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[4] U.S. EPA, *Surface Impoundment Assessment National Report* (1983); "Hearing on H.R. 2253, The Groundwater Research, Development, and Demonstration Act and H.R. 791, The National Ground Water Contamination Information Act of 1987", Hearing before the Subcommittee on Natural Resources, Agriculture Research, and Environment of the Committee on Science, Space, and Technology, U.S. House of Representatives, 100th Congress, First Session, July 21, 1987 (hereinafter cited as "Hearing"), Prepared Statement of Mr. Erik D. Olson, National Wildlife Federation 11-12.)

[5] Conservation Foundation, *Groundwater Protection* 107-108 (1987).

[6] Hearing, *supra*, Prepared Statement of Mr. Erik D. Olson, National Wildlife Federation 10-11.

[7] U.S. EPA, *CERCLA Section 301(a)(1)(c) Study* ii (1984).

[8] U.S. EPA, *Report to Congress on Injection of Hazardous Waste* II-2 (1985).

dispose of waste fluids. While sound constructions and design theoretically provide protection against ground water contamination, improper design, construction and operation have lead to instances of serious ground water contamination.[9] Activities other than waste disposal practices can also contaminate ground water. Some of these major sources of contamination include leaking underground storage tanks and pipelines, agricultural practices, and other miscellaneous activities.

Leaking underground tanks and pipelines.—There are anywhere from 5 to 10 million underground storage tanks, most made of steel with a life expectancy of 15 to 20 years. As many as one-fourth to one-third of tanks containing petroleum or gasoline may be leaking, posing a potential threat to ground water.[10]

Agricultural practices.—Widespread use of pesticides and fertilizers have contributed to ground water contamination in many rural parts of the country. Irrigation practices can increase the salinity and metal concentrations of ground water, and animal wastes from livestock can increase concentrations of nitrates in ground water. The potential of pesticides to contaminate ground water is illustrated by the case of Long Island, New York. Aldicarb was used on potato crops from 1975 to 1979. By 1980, the State found levels of Aldicarb exceeding the state drinking water standards in nearly a third of the ground water samples, and the area contaminated was nearly four times larger than the area in which the Aldicarb had been applied.[11]

Other activities.—Other sources of ground water contamination include oil and gas exploration, mining, road deicing salts, and urban storm runoff.

Systematic efforts to measure the extent of ground water contamination in the U.S. have been limited for several reasons. First, detecting contamination is difficult since contaminant plumes may be highly localized and concentrated; consequently, whether contamination is detected will depend on the placement of the monitoring wells. Secondly, analytical techniques, particularly for organic chemicals, are expensive, difficult, and time-consuming. While knowledge is limited, however, most experts believe that only a small percentage of ground water—perhaps 1 to 2 percent—has been polluted. Specific incidents, however, illustrate the serious potential for more widespread contamination.

In 1984, water in some 8,000 wells was reported to be unusable or degraded due to ground water contamination; instances of ground water contamination have been reported in all 50 states.[12] A 1984 Office of Technology Assessment report found that some 175 organic chemicals and 50 inorganic chemicals had been found in ground water throughout the U.S.[13]

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[9] Conservation Foundation, *Groundwater Protection, supra,* 112-113.

[10] Congressional Research Service, *Groundwater Contamination from Petroleum Underground Storage Tanks* 1 (1985).

[11] U.S. EPA, *Perspectives on Non-Point Source Pollution* 101 (1985).

[12] U.S. EPA, *Ground-Water Protection Strategy* 16 (1984).

[13] Offgice of Technology Assessment, *Protecting the Nation's Groundwater from Contamination* 23 (1984).

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Some of the more common contaminants include nitrates, biological contaminants, synthetic organic chemicals, inorganic contaminants, and radionuclides.

Nitrates.—Perhaps the most common ground water contaminants are nitrates, caused by fertilizers, septic tanks, animal wastes, and municipal landfills. One national well study by the USGS showed that 20 percent of the wells had nitrate concentrations greater than 3 milligrams per liter (mg/l); by comparison, EPA's drinking water standard is 10 mg/l.[14]

In six states, about ten percent of the non-randomly sampled wells had nitrate levels higher than EPA's drinking water standards. High levels of nitrates can cause "blue baby disease". Preliminary evidence has also linked high levels of nitrates with cancer, impairment of the nervous system, and birth defects.[15]

Biological contaminants.—Biological pathogens, introduced by improper disposal of human and animal wastes, are also surprisingly common, particularly in rural areas. One EPA survey indicated that 30 percent of the nation's rural ground water systems exceeded EPA's microbiological drinking water standards.[16]

Synthetic Organic Chemicals.—Synthetic organic chemicals have also been detected in ground water, frequently at much higher concentrations than in surface waters. Twenty percent of the nation's drinking water supplies contain at least one organic chemical contaminant.[17] Organic pesticides have been found in the ground water of at least 23 states.[18]

Information on the health effects of exposure to synthetic organic chemicals in ground water (through ingestion or inhalation) is highly limited. Many synthetic organic ground water contaminants are probable or proven carcinogens; others have been linked to a wide variety of serious health effects, including birth defects, reproductive impairment, liver damage, and neurotoxic effects.[19] The actual health effects of such substances in ground water, however, is unknown. Controlled epidemiological studies are difficult, if not impossible, to conduct.

Inorganic Contaminants.—Elevated levels of metals such as lead, arsenic, cadmium, mercury and selenium have also been found in ground water supplies. EPA's survey of rural water supplies showed high regional levels of such metals in ground water. For example, EPA found that almost one-fourth of all rural wells exceeded EPA's drinking water standard for mercury, and ten percent exceeded the standard for lead. In the West, 41 percent of the wells exceeded the standard for selenium.[20]

Radionuclides.—Radionuclides, radioactive particles which can exist naturally in ground water, can also result from contamination from radioactive waste disposal. Little is known about the

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[14] U.S. Geological Survey, *National Water Summary 1984, supra,* 96 (1985).
[15] Conservation Foundation, *Groundwater Protection, supra,* 95–96.
[16] U.S. EPA, *National Statistical Assessment of Rural Water Condition* 4 (1984).
[17] Conservation Foundation, *Groundwater Protection, supra,* 77–88.
[18] U.S. EPA, *Pesticides in Groundwater: Background Document* 9 (1986).
[19] *Generally,* Office of Technology Assessment, *Protecting the Nation's Groundwater from Contamination, supra,* 23–34.
[20] U.S. EPA, *National Statistical Assessment of Rural Water Conditions, supra,* 8.

levels of radionuclides in ground water or whether such levels pose any health risks.

B. Ground Water Protection and Regulation

No federal legislation exclusively addresses ground water protection; for the most part, the responsibility for managing ground water resources lies with the States under present laws. States' responses to ground water protection have varied widely; several States have aggressively pursued policies, using land use planning and zoning authority, to protect ground water from contamination, while other States have been less active. According to the testimony of Ms. Roberta Savage, Executive Director of the Association of State and Interstate Water Pollution Control Administrators, 40 States have, or are in the process of developing comprehensive ground water management strategies and 33 States have or are developing ground water quality standards or use classificiation systems.[21] The emphasis of these efforts, however, vary, with some standards relating to drinking water quality while others manage the impacts of industrial activities on ground water.

At least three federal agencies, however, play some regulatory or research role with respect to ground water quality and quantity: the Environmental Protection Agency (EPA), the U.S. Geological Survey (USGS), and the Department of Agriculture (USDA).

EPA has limited regulatory responsibility for ground water quality under six statutes. The Safe Drinking Water Act (SDWA), as amended in 1986,[22] protects the safety of public drinking water supplies, including ground water that is a source or potential source of drinking water. EPA is required under the Act to set maximum contaminant levels (MCLs). EPA also regulates underground injection of wastes under this Act. The Act also provides federal grants for elective state "wellhead protection programs" and "sole source aquifer protection programs", although Congress has not yet appropriated funds to carry out these provisions.

EPA also administers the Clean Water Act.[23] Amendments passed early in the 100th Congress strengthen the Act's provisions on ground water, including a grant program to carry out state ground water protection activities. Congress has not, however, appropriated funds for this grant program.

The Resource Conservation and Recovery Act (RCRA)[24] regulates the disposal of municipal solid wastes and hazardous wastes. Under RCRA, EPA regulates disposal practices to prevent the future contamination of ground water from hazardous waste sites. Amendments to the Act in the 99th Congress also addressed leaking underground petroleum storage tanks, requiring tank owners to obtain financial responsibility and establishing a $500 million spill cleanup fund.

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[21] Hearing, *supar*, Prepared statement 2-3.

[22] Safe Drinking Water Act, P.L. 93-523 (1974); Safe Drinking Water Act Amendments, P.L. 99-339 (1986).

[23] Federal Water Pollution Control Act Amendments of 1972, P.L. 92-500 (1972); the Clean Water Act of 1977, P.L. 92-217 (1977); Water Quality Improvements Act of 1987, P.L. 100-4 (1987).

[24] The Resource Conservation and Recovery Act of 1976, P.L. 94-580 (1976); Hazardous and Solid Waste Amendments of 1984, P.L. 98-616 (1984).

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or Superfund)[25] authorizes the clean-up of uncontrolled hazardous waste dump sites, most of which are contaminating ground water. Remedial efforts have included efforts to clean up contaminated aquifers.

The Toxic Substances Control Act (TSCA),[26] and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)[27] give broad authority to EPA to regulate toxic chemicals and pesticides by requiring manufacturers to screen and test chemicals for possible health and environmental effects.

In 1984, the EPA announced a "Ground Water Protection Strategy" to help coordinate and consolidate the Agency's activities under its several authorities. As part of its ground water program, EPA issued a ground water monitoring strategy in 1985 and proposed guidance for classifying aquifers in 1986, and is developing a strategy for agricultural contaminants in ground water.

EPA's Office of Research and Development (ORD) conducts research in support of the above regulatory statutes. While there is no centralized ground water research program in EPA, some ground water research is conducted as a part of the overall research carried out in support of the above statutes. EPA estimates that it is spending a total of $30.5 million on ground water-related research in FY 87, although all but about $8 million of this amount is spent on hazardous waste disposal issues. Most of those research funds, however, support extramural research by contractors; only about $7.6 million is spent on in-house research at EPA labs.

The U.S. Geological Survey also has ground water research responsibilities. The USGS, which traditionally has conducted basic research, monitoring, and analysis of surface waters, has gradually increased its ground water research efforts. Initially, USGS efforts focused on ground water hydrology, quantity and "traditional" contaminants such as nitrates and metals, but contamination by synthetic organic chemicals has received growing attention in recent years. In FY86, the USGS ground water research budget exceeded $90 million. Ground water research is presently centering on several programs within the Water Resources Division.

Unlike EPA, the great majority of USGS's research is conducted in-house by USGS employees. About $50 million of USGS total water research program is allocated to a Federal-State cooperative program, under which States assist in identifying research projects and provide matching funds to support USGS research projects.

USGS is also spending about $12 million on its Toxic Substances Hydrology Program, two components of which are specifically directed at research on contaminated ground water: (1) detailed field investigations at six sites of different types point-source ground water contamination; and (2) assessment of non-point source contamination in 14 regional aquifers, six of which will be continued in FY 87. USGS has begun four surface water and three grounds water pilot studies to tests the feasibility of conducting a national

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[25] Comprehensive Environmental Response, Compensation and Liability Act, P.L. 96-510 (1980); Superfund Amendments and Reauthorization Act of 1986, P.L. 99-499 (1986).
[26] Toxic Substance Control Act, P.L. 94-469 (1976).
[27] Federal Environmental Pesticide Control Act, P.L. 92-516 (1972).

water quality assessment which would include over 90 water basins accounting for 80 percent of U.S. water use.

USGS also spends between $4 and $5 million annually to support 54 Water Research Institutes, usually located at a Federal land-grant college or university within a state or territory. The Institutes train graduate students in hydrogeology and conduct research. USGS also runs a $4 million peer-reviewed grants program, which partially supports ground water related research.

USDA's Agriculture Research Service carries out ground water research on the fate and transport of nutrients and pesticides in ground water, and measures salinity in ground water as influenced by irrigation practices. The goals of the programs are to improve water management practices, conservation tillage, and other cropping systems; to devise new chemical control technologies; and to develop more efficient application practices for pesticides and fertilizers.

USDA also funds research and extension activities through the Land-Grant University system, state Agricultural Experiment Stations, and the Cooperative Extension Service. Recently, the National Association of State Universities and Land Grant Colleges proposed a $55 million ground water research and extension program to be funded through peer-reviewed grants administered by USDA's Cooperative State Research Service.

C. Information and Research Needs Concerning Ground Water

Scientists, ground water experts, and public officials agree that our present knowledge about ground water contamination is inadequate and that an expanded research effort is necessary to provide information needed to manage and protect ground water resources and to clean up contamination where it already exists.

As the Final Report of the National Groundwater Policy Forum concluded,

> The success of groundwater management policies depends upon an adequate base of knowledge. For example, a state cannot determine whether its groundwater standards are being met or whether public health and the environment are being protected without a groundwater monitoring program. Yet information about groundwater quality, and about the role of groundwater in the hydrogeologic cycle, has lagged far behind our knowledge of water in the atmosphere and on the surface. The past two decades have seen increased spending for research applicable to groundwater management, but we believe that substantially more information is needed.[28]

To prevent future ground water contamination and to manage ground water resources, State and local officials need to understand the potential sources of contamination in their areas, methods to control such sources of contamination, and the hydrological characteristics of specific aquifers that supply ground water in

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[28] National Groundwater Policy Forum, *Groundwater: Saving the Unseen Resource*, published in *Groundwater Protection*, *supra*, 24-25; cited in *Hearing*, *supra*, Prepared Statement of Mr. Philip Metzger, Conservation Foundation at 4.

their areas. Such information can then be used to make zoning, land use planning, and environmental management decisions. For example, such information would be critical in determining whether a particular site could be developed for industrial use and associated waste disposal activities consistent with the protection of ground water supplies.

To address existing levels of contamination, State and local officials need additional information. They need to understand the dispersion and movement of contaminants in their aquifers, which requires monitoring, analytical techniques, and modeling. They need to understand the potential health effects of the contaminated ground water. They also need to have engineering solutions for cleaning up or stopping the spread of contaminants in an aquifer.

States simply do not have the resources to support comprehensive ground water research to provide these information needs.[29] As noted by representatives of a Long Island, New York, business association, the number of political jurisdictions, water suppliers, and other related companies makes it "next to impossible" for local communties to undertake the needed research.[30]

Witnesses also agreed that the Federal government is not doing enough to gather this information and to assist State and local governments.[31] Several witnesses specifically noted the need for research conducted by the U.S. Geological Survey to be more relevant to State management needs.[32]

Data and information needs highlighted by the record include better information on national ground water quality status and trends, better understanding of fate and transport of toxic chemicals, improved monitoring and analytical measurements, better understanding of health and ecological effects, improved technologies on in-situ aquifer cleanups, improved access to information, and increased support for technical training.

Witnesses agreed that available information about the extent of ground water contamination nationally is poor. Monitoring data is frequently collected on a state-by-state level, and there is no national monitoring system to track the extent or the trends of ground water contamination. Existing data are frequently incomplete, inconsistent, and incomparable. Although there is much scattered local and regional data on ground water quality, there is no central collected sources for this information.

There are also major uncertainties about how contaminants move and change in ground water under a wide variety of common hydrogeological conditions, yet an understanding of these topics is necessary to develop models which can assist State and local officials in protecting and cleaning up ground water supplies. Basic research is needed to continue the development of models which pre-

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[29] Hearing, *supra*, Prepared Statement of Mr. Charles Malloch, Chemical Manufacturers Association at 4.

[30] Hearing, *supra*, Mr. Mitch Pally, Long Island Association, tr. at 73.

[31] Hearing, *supra*, Prepared Statement of Ms. Roberta Savage, Association of State and Interstate Water Pollution Control Administration, at 5-6; Mr. Erik Olson, National Wildlife Federation, tr. at 50; Prepared Statement of Mr. Charles Mallock, Chemical Manufacturers Association, at 4; Prepared Statement of Ms. Judy Campbell Bird, Environmental and Energy Study Institute, at 2.

[32] Hearing, *supra*, Prepared Statement of Mr. Erik Olson, National Wildlife Federation at 12-13; testimony of Mr. Philip Metzger, Conservation Foundation, tr. 61.

dict contaminant movement and transformation, particularly in complex aquifer systems. Relatively little is also known about biological behavior in contaminated aquifers.

Part of the difficulty in obtaining better information about ground water contamination stems from inadequate monitoring equipment. Monitoring technology generally remains cumbersome, costly, and imprecise. In particular, testing for synthetic organic chemicals is a costly and time-consuming task. The Illinois EPA has estimated, for example, that it will take 4 to 5 years to complete just one round of organic compound testing for the 3,400 public water wells in Illinois alone—not including the half a million estimated public wells in the State. OTA estimated that an analysis of ground water quality samples from the 12 to 14 million wells in the U.S. could cost $7 billion or more—and provide little information about trends.[33]

Perhaps one of the major data gaps plaguing State and local officials is the lack of information on health and ecological effects caused by various routes of exposure to contaminated ground water.[34] With respect to pesticides alone, for example, a 1984 National Academy report estimated that there was adequate toxicological information on only 10 percent of registered pesticides.[35]

Aquifer clean-ups have proven to be be costly and frequently ineffective. New methods for restoring degraded aquifers, including the use of biological organisms, must be developed and demonstrated to give Federal, State and local officials a wider array of tools in cleaning up contaminated ground water supplies.

While a good deal of ground water data and research presently exist, witnesses stated that it is frequently not accessible in a place or in a form that is usuable for the State and local officials who need the information.[36]

The 1984 OTA Report, *Protecting the Nation's Groundwater,* noted that the detection, correction, and prevention of contamination depends in part on highly skilled personnel who are generally in short supply. A 1985 OTA Report, *Superfund Strategies,* conducted a personnel needs survey for Superfund clean-ups, many of which involve ground water contamination. Ground water hydrologists ranked at the top of the list. The OTA *Superfund Strategies* report concluded that additional emphasis on training in toxicology, hydrology, and engineering geology would be necessary to prevent shortages in these areas.

D. Improvements Needed in Federal Research Program

Because EPA's ground water responsibilities are spread out over several different regulatory programs, there is no centralized ground water research program at EPA. Further, EPA's ground water research agenda, which is largely shaped by the demands of the regulatory offices, has generally been limited to supporting those regulatory programs. In particular, EPA's ground water research program has been weak in assessing contamination from

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[33] Office of Technology Assessment, *Protecting the Nation's Groundwater, supra,* 1984.
[34] Hearings, *supra,* testimony of Mr. Donald Middleton, Long Island Association, tr. 77-78.
[35] National Research Council, *Toxicity Testing* 12, 1984.
[36] Hearing, *supra; see, e.g.,* Testimony of Ms. Roberta Savage, Association of State and Interstate Water Pollution Control Administrators, tr. at 132.

sources it does not regulate, such as fertilizers, septic tanks and other non-point sources.

Reviewing EPA's ground water research program in 1985, the EPA's independent Science Advisory Board (SAB) concluded that EPA's ground water research program was "inadequate to support the Ground Water Strategy or future regulatory and policy needs." [37]

One of the SAB's major recommendations addressed the lack of an integrated ground water research program. The SAB recommended EPA's Office of Research and Development (ORD) establish a "strong central direction for its ground water research program, with appropriate authority for the program director." The SAB also recommended that EPA should: (1) begin research on contamination sources not addressed by laws; (2) establish a formal interagency research coordination effort; (3) identify the pending ground water policy decisions and their research and information needs; (4) increase overall funding for ground water research, particularly in monitoring; (5) increase work on the development of accurate sampling and analytical methods; (6) increase efforts to validate models in the field; (7) increase research on the basic processes that govern transport and fate of contaminants; and (8) develop a "greatly expanded" ground water technology transfer and training program.

While EPA has responded to some of these recommendations, the lack of increased funding and the diversion of resources to other areas has precluded EPA from expanding its ground water research program to address these particular problems.

Witnesses also expressed concern about the lack of coordination between the Federal agencies on ground water research. As stated by Philip Metzger of the Conservation Foundation:

> Countering fragmentation among federal agencies means coordination. Now, that may not seem like a very sexy topic, but the lack of coordination has been at the heart of our failure to protect groundwater in the past. Each law, each agency, each government office has looked at groundwater protection from its own narrow perspective—of drinking water, sludge disposal, hazardous waste dumps, or whatever—and, as a result, too many problems have fallen through the cracks. The same risks are present in groundwater research.[38]

No single Federal agency has a comprehensive ground water research program; each agency has its strengths and weaknesses. For example, witnesses acknowledged that USGS has the most expertise in "basic" ground water research, which attempts to provide a better understanding of the hydrogeology of ground water. USGS is also the acknowledged lead agency on issues relating to ground water quantity and depletion.

EPA has acknowledged expertise with respect to site-specific contamination of ground water resources, particularly those caused by hazardous waste. EPA's engineering research has also focused on

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[37] U.S. EPA, Ground Water Research Review Committee, Science Advisory Board, *Review of the EPA Ground Water Research Program* (1985).

[38] Hearing, *supra*, Prepared Statement at 7.

clean-up technologies for contaminated aquifers. EPA also has greater expertise in biology and health effects research. Because of EPA's focus on research supporting regulation, research is aimed at providing information that is useful for officials to prevent or mitigate ground water contamination.

At the same time, there is also apparent overlap and potential duplication which was of concern to EPA's Science Advisory Board. For example, EPA, USGS, and USDA all support research, development, and validation activities with respect to ground water modeling. Both EPA and USGS work on the development and demonstration of monitoring protocols and analytical technology. Similarly, EPA and USGS both conduct assessments of ground water contamination. EPA, for example, is presently conducting a national assessment for pesticides in ground water while USGS continues pilot studies in preparation for a national assessment. EPA, USGS, and USDA all fund university-based research on ground water, although each agency has its own procedures and programs.

While EPA and USGS have entered into a Memorandum of Understanding to guide the ground water research programs of the two agencies, the EPA witness admitted that it was "difficult to discern a nice, sharp break" between the two agencies' responsibilities outlined in the Memorandum.[39] Both USGS and EPA agreed that there was communication at the staff level, but little overall policy or planning coordination.

IV. EXPLANATION OF THE BILL

A. Summary

The bill has been amended by the Committee to bring together the capabilities and expertise of the several Federal ground water research agencies into a single, coordinated and comprehensive ground water research program that can assist State and local governments in protecting and managing groundwater. As amended, the bill includes the major provisions of both the H.R. 791, as reported by the House Committee on Interior and Insular Affairs, and H.R. 2253, the "Ground Water Contamination Research, Development and Demonstration Act." For example, the bill substantially retains the provisions of H.R. 791 which authorize the USGS to prepare an assessment report, to establish a national assessment program, to establish a ground water clearinghouse, and to provide technical assistance to State and local governments. Similarly, the bill includes the major provisions of H.R. 2253 which direct EPA to establish a ground water research program, including a technology demonstration program, to establish a technical assistance program, and to implement several internal programs to enhance EPA's capabilities in the ground water area.

In addition, the bill as amended contains several new sections not contained in either H.R. 791 or H.R. 2253 as introduced. The amended bill includes a section on interagency coordination to ensure that each agency's activities are coordinated with an overall research program and plan. The amended bill also requires EPA to prepare risk assessment analyses for significant ground water con-

[39] Hearing, *supra*, Testimony of Mr. Don Ehreth, tr. at 44.

taminants, and requires scientific studies to be subject to appropriate peer-review.

The amended bill designates the EPA and the USGS as lead federal agencies for the purposes of specified activities. In making such designation, the Committee does not intend to imply that these two agencies should be the only agencies involved with ground water research. The Committee fully anticipates that other agencies, in particular the Department of Agriculture, should and will play a significant role in this area. The Committee has only addressed those areas where it believes the EPA and USGS need specific Congressional direction to avoid duplication and conflict. Other areas of potential overlap clearly exist and should be resolved by the interagency coordination mechanism established in the amended bill.

F. Findings, Definitions and Purposes

Section 2 of the amended bill contains various findings. The findings state that ground water is a resource of significant economic value, that the sources of ground water contamination are diverse, that ground water contamination has occurred in every State and is being detected with increasing frequency, and that such contamination has had significant adverse effects.

The bill recognizes that, under present law, States and local governments have the primary responsibility for protecting and managing ground water resources. Historically, State responsibility stems from the local nature of ground water and potential impacts on it, and on the fact that States have always exercised primary jurisdiction over ground water through State common law, State water quantity and resource management law, and State land use management law. The power to prevent ground water contamination, for example, depends in part on land use controls which have largely been managed through zoning ordinances and other powers which lie with the States and not the Federal government. Therefore, regardless of continuing policy questions regarding the role of the Federal government in ground water regulation, which the Committee does not address in this bill, building the capacity of State and local governments to manage ground water is a critical issue.

While States may at the present time have primary regulatory responsibility, as noted previously, few States have the resources to support a comprehensive research program on an issue as complex as ground water. Further, it makes little sense for each State to conduct its own research on ground water topics that have universal applicability, such as health effects of contaminants or monitoring technologies. Therefore, the Committee finds that the Federal government should conduct research, disseminate information, and provide technical assistance to support State ground water programs.

There is, however, no present Congressional mandate for Federal agencies to conduct a comprehensive ground water research and technical assistance program for the States. As discussed previously, each Federal agency with ground water research responsibilities has its own mission and priorities, and there is no overall coordination of ground water research. Nor do the Federal research pro-

grams have as a major focus assisting States in protecting and managing ground water resources. The Committee concludes, therefore, that current Federal programs do not provide adequate assistance for States and local governments.

Further, major scientific uncertainties, technological shortcomings, a shortage of scientists and engineers trained in ground water related disciplines, and data gaps continue to hinder the ability of decisionmakers to develop effective policies to protect and manage groundwater. Given the fact that preventing ground water contamination is much more cost-efficient than cleaning up contaminated ground water, the Committee finds that a greater Federal effort is needed to assist the States in protecting ground water resources.

Section 3 of the bill sets out definitions used in the bill, and Section 4 sets out seven purposes of the Act. The purposes of the Act are: to establish a comprehensive and coordinated program of ground water research within the Federal government; to provide incentives for development of new technologies for preventing, monitoring, and cleaning up ground water contamination; to authorize specific ground water research and technical assistance programs at the EPA and USGS; to enhance EPA's internal ground water research capabilities; to improve the knowledge of ground water quality conditions and trends; to provide for technology transfer and technical assistance to States and local governments in managing and protecting ground water resources; and to provide training in scientific disciplines relevant to ground water management and protection.

C. Interagency Coordination

It is clear to the Committee that the present fragmented and duplicative ground water research efforts of the several Federal agencies is wasteful and ineffective in providing States and local governments with the information and assistance they need to develop management policies. The need for more formal coordination of Federal research activities was widely acknowledged by witnesses.[40] Section 5 of this bill as amended addresses this problem through several provisions intended to bring together the expertise and capability existing in the Federal agencies into a coordinated and comprehensive ground water research program.

The bill as amended establishes an Interagency Ground Water Research Committee, consisting of all of the Federal agencies involved with ground water. The Interagency Ground Water Research Committee (hereinafter referred to as the Research Committee) provides a vehicle for Federal agencies to communicate with each other, to identify research needs and priorities, and to prepare a coordinated research plan. A single entity provides the Federal ground water research program with a centralized mechanism for ensuring that the activities of each agency are complementary and relevant to overall goals and objectives of a comprehensive research program. While each agency retains its authority over its

[40] *Supra*; *see, e.g.*, Prepared Remarks of Mr. Philip C. Metzger, Conservation Foundation, at 6–7; Prepared Remarks of Mr. Charles D. Malloch, Chemical Manufacturers Association, at 5–7; testimony of Mr. Don Ehreth, Environmental Protection Agency, transcript at 32.

own research budget, the Research Committee is intended to encourage each agency to view its own programs in context of the total research program. In areas of overlapping responsibilities, the Research Committee provides a mechanism for resolving potential waseful duplication and, where appropriate, the designation of lead agencies.

The bill directs the President to establish the Interagency Ground Water Research Committee within 90 days of enactment of the Act. Each Federal agency involved in ground water related activities is required to have a representative of the agency on the Research Committee.

The bill leaves some flexability to the President to determine which agencies are required to be members of the Research Committee. Many Federal agencies have some indirect involvement in ground water activities; for example, the Department of Energy and the Department of Defense both own or operate facilities which have serious potential for contaminating ground water. In addition, as knowledge and awareness of ground water issues continues to increase, Federal agencies may find their own involvement in ground water issues changing and increasing, and the membership of the Research Committee may therefore change over time as well. Whether such agencies have sufficient involvement or experience with ground water to contribute to or benefit from the Research Committee is left to the President to determine. At a minimum, however, the bill specifies that the EPA, the USGS, the Department of Agriculture, and the Department of Health and Human Services be represented on the Research Committee, in light of the research expertise and capabilities existing within those agencies. Within the Department of Health and Human Services, the National Institute for Environmental Health Sciences, the Agency for Toxic Substances and Disease Registry, and the National Toxicological Program all have significant and relevant expertise to this program.

The bill also specifies that EPA and USGS be co-chairs of the Research Committee, reflecting the fact that these two agencies are, as a practical matter, the leading ground water research agencies in terms of budget, expertise and experience. Given the particular importance of the two agencies, it is critical that they work closely and cooperatively together. The bill also requires the Research Committee to hold at least two public meetings a year.

Section 5(b) specifies the function and duties of the Research Committee. The Research Committee is charged with identifying the major research data needs and scientific uncertainties regarding ground water characterization, monitoring, protection, management and restoration. The Research Committee is also responsible for developing overall priorities and a coordinated research plan for addressing the data needs and scientific uncertainties.

State and local officials with ground water management responsibilities are intended as one of the major beneficiaries of the research program. Section 5 therefore requires the Research Committee to consult actively with such officials and other appropriate interested parties (including environmental organizations and industry members) in determining responsibilities. Witnesses emphasized the importance of continuous interaction with outside parties

to ensure the relevance of the research to real-world needs of ground water managers.[41]

Section 5(c) requires the Research Committee to submit a biannual report on the research program to Congress, beginning in January 1989. The report is intended to provide information on both the accomplishments and the plans of the coordinated ground water research program. The report will enable Congress to oversee the implementation of the Act more effectively.

Section 5(d) requires each member agency of the Research Committee to enter into agreements or memoranda of understanding with the other members of the Research Committee, detailing the responsibilities of each entity. Such agreements provide an effective means for agencies to avoid duplication.

D. National Ground Water Assessment Program

Section 6 of the amended bill establishes a national ground water assessment program to assist Federal, State and local governments in assuring that they have the data and information they need to characterize, protect and manage ground water resources. The Secretary of the Interior, in consultation with the Research Committee, is designated as the lead Federal official for activities under this section. The provisions of Section 6 are substantially similar to Title II of H.R. 791 as reported by the House Committee on Interior and Insular Affairs.

Section 6(b) requires the Secretary to prepare a one-time report to Congress within one year which evaluates the adequacy of existing Federal ground water data and information collection efforts. The report is to include an assessment of existing ground water quality and quantity information systems, including a description of geographic areas and categories of data where insufficient quality and quantity information is available. The report should also contain an evaluation of the adequacy of existing monitoring programs for projecting long term status and trends in ground water contamination, and the availability of existing ground water data. Finally, the report should include recommendations for actions to enhance the use of existing information and to improve data collection programs.

Section 6(e)(1) of the amended bill provides a broad authority for the U.S. Geological Survey to assist State and local governments in ground water assessment activities needed to manage or protect ground water resources. Ground water assessment is a critical first step in any State or local effort to protect or manage ground water resources. Assistance which would be authorized under this section would include (but not be limited to) such activities as ground water mapping, the design of ground water monitoring programs, quantifying the geological properties, quantity and quality of ground water, assisting in developing appropriate classifications of ground water resources, and identifying and evaluating technol-

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[41] Hearing, *supra; see, e.g.*, Prepared Statement of Mr. Erik D. Olson, National Wildlife Federation, at 21-22; Testimony of Mr. Philip Metzer, Copnservation Foundation, transcript at 61; Prepared Statement of Mr. Charles Malloch, Chemical Manufacturers Association, at 7; Prepared Statement of Ms. Roberta Savage, Association of State and Interstate Water Pollution Control Administrators, at 5-6; Record Submission by Interstate Conference on Water Policy at 3.

ogies for different management options. Such activities would assist States in establishing its ground water objectives and standards and in identifying current and future uses of ground water.

The assistance program is not intended, however, to impose ground water policies on States. Nothing in this Act requires the State to take any action to protect or manage its ground water resources, and decisions on ground water policy are left strictly to the State's discretion. For example, a State could decide to treat all of its ground water in the same way, or may decide to classify ground water into separate categories that may require different management approaches. Alternatively, a State could decide not to assess its ground water resources at all.

As part of the ground water assessment program, the Secretary is also required to provide information regarding protocols and quality controls, to develop recommend valid protocols, and provide guidance regarding the comparison of data collected under different methods and quality assurance programs. As noted previously, there is an urgent need for more reliable, less costly, and less time-consuming monitoring and analytical techniques. Further, because much of the existing data about ground water has been collected under different protocols and for different reasons, existing data cannot be used to determine ground water quality and quantity trends or even provide a comprehensive description of present ground water resources. USGS should therefore take the lead in developing and encouraging the use of protocols in existing data collection programs which are consistent and reliable.

At the same time, the Committee recognizes that monitoring methods and protocols must vary depending upon the purpose for taking the measurement, and that there is no single procedure which can satisfy all needs. For example, EPA in its regulatory programs or in enforcement proceedings may need to use protocols which are different than those needed by scientists to assess ground water quality. Therefore, section 6(g) of the bill makes it clear that any recommended protocols developed by the USGS under this section are in no way legally binding on any other Federal, State or local agency, who must determine for themselves what protocols best serve their purposes.

As part of the assessment program, the Secretary is directed to encourage the use of existing Federal-State programs, such as the Federal/State cooperative program in the USGS. Further, the program should include research which improves the scientific knowledge and understanding of the nature and extent of ground water contamination on a site specific basis. Finally, the program should provide information and data which will complement the collection of surface water quality data to provide an integrated knowledge of water quality conditions within specific hydrogeologic regions and subregions. The Secretary is authorized under section 6(f) to obtain ground or surface water quality information from other Federal agencies or State and local governments subject to existing legal restrictions on confidentiality and disclosure.

The assessment program reflects a true partnership between the Federal agencies and State and local governments. The primary focus of this program should be directed at assisting State and local governments to manage and protect ground water, not on collect-

ing data for the sake of collecting data. In many cases, State and local governments may initiate the request for assistance under this program; in other cases, the USGS, in conjunction with the Research Committee, should take the initiative to propose assessment activities where a significant resource is being threatened by contamination or where such assessment may provide a significant research opportunity which could gain important information.

The Committee supports the studies of critical aquifers currently being conducted by the USGS. In particular, the Committee supports USGS funding of a groundwater study on Block Island, Rhode Island. This island, which has been designated a sole source aquifer by the EPA, is experiencing ground water contamination problems which threaten the Island's ponds and drinking water sources. Detailed knowledge of the complex underground water supply must be obtained in order for the island to be able to preserve and manage this vital resource. The Committee urges the USGS to support completion of the three year comprehensive study, and to continue the work with local and State officials to secure the necessary funding for the project.

E. National Research, Development and Demonstration Program for Ground Water Protection and Management

Section 7 designates the Administrator of the EPA as the lead agency official for carrying out, in consultation with the Research Committee, a ground water research, development, and demonstration program. The program is intended to support both the EPA's existing regulatory responsibilities and to assist State and local governments in the protection, management, and restoration of ground water resources. Section 7 directs the EPA to conduct a broad-based research program and to establish a program to demonstrate promising new technologies for controlling sources of ground water contaminants or in mitigating ground water contamination.

Section 7(a) authorizes and directs the Administrator to conduct a research program relating to the sources, causes, effects, extent, prevention, detection, monitoring, and mitigation of ground water contamination. This relatively broad grant of authority is intended to give the Administrator sufficient flexibility to address ground water contamination in a comprehensive fashion without being limited to research directly supportive of the EPA's regulatory mission. Where such activities could overlap with those of other Federal agencies, the EPA is expected to avoid unnecessary duplication and to coordinate its activities through the Research Committee.

Section 7 directs EPA to establish a program to develop and demonstrate new technologies, including full-scale demonstrations, which could be effective in controlling sources of ground water contamination or in cleaning up contaminated ground water. Witnesses indicated a "lack of federal commitment" for the development of improved technologies (including processes, practices, methods, and products) for use in managing ground water, including improved monitoring and analytical technologies, sampling, control technologies, and ground water clean-up tech-

nologies.[42] The program is similar to the demonstration program authorized in Section 212(b) of the Superfund Amendments and Reauthorization Act of 1986.

The bill directs the EPA to develop and publish a list of priority needs with respect to source controls. The list of needs should be developed in consultation with the Research Committee and with an opportunity for public input. The Committee encourages the EPA to place a high priority on agricultural sources of ground water contamination, including fertilizers, pesticides, irrigation practices, and animal feed lots.

To be eligible for the demonstration program, a project must be found by the Administrator to meet six criteria. First, the project involved must be designed to demonstrate a new technology or, in the case of existing technologies, its feasibility or cost-effectiveness. Second, the project must not duplicate existing efforts to demonstrate the technology. Third, the demonstration must be able to be carried out in compliance with environmental and other laws, although the Administrator may, under Section 7(j), issue expedited research permits. Fourth, the Administrator may provide funding only if he finds that the project would otherwise be unable to be financed. Fifth, the project must meet a priority need previously identified by the Administrator. Finally, the project may not be a "alternative or innovative treatment technology" eligible for demonstration assistance under section 311(b)(5) of the Comprehensive Environmental Response, Compensation and Liability Act, as amended. This latter provision is intended to ensure that treatment technologies which could be used in Superfund remedial actions be demonstrated only under the existing Superfund demonstration program. Ground water mitigation technologies not applicable to use in Superfund sites, however, would be eligible for the demonstration program set out in this bill.

Similar to the Superfund demonstration program, section 7(d) sets out procedures for solicitating, selecting, supervising, and evaluating demonstration projects. In selecting the technologies to be demonstrated, the Administrator is directed to consider three factors: (1) the potential of the technology to control or mitigate sources of the most dangerous ground water contaminants where present controls are inadequate; (2) the capability of the applicant to complete the demonstration successfully and to make the benefits available to the public in a timely manner; and (3) the likelihood that the demonstrated technology would, taking cost-effectiveness into account, have a significant application. A significant application includes, but is not limited to, a technology which could be used to address a widespread problem, or one which addresses a less common problem which could nevertheless achieve a significant reduction in risk to human health or the environment.

Section 7(i) also requires the Administrator to seek the maximum practicable cost sharing agreements with applicants and other Agencies.

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[42] Hearing, *supra; see, e.g.*, testimony of Mr. Donald Ehreth, Environmental Protection Agency, tr. at 11-12; Prepared Statement of Mr. Erik D. Olson, National Wildlife Federation, at 17; Prepared Statement of Ms. Judy Campbell Bird, Environmental and Energy Study Institute at 3-5.

F. Ground Water Contaminant Risk Assessment Analysis

Section 8 of the amended bill requires EPA, in consultation with the Research Committee, to conduct and publish a risk assessment analysis for each significant ground water contaminant. It replaces a section in H.R. 2253, as introduced, with respect to health effects.

Section 8 responds to the nearly universal agreement expressed at the hearings that one of the primary needs of the States and local officials is for information on the health and environmental effects of ground water contaminants, which can then be used by the States and local officials to set ground water quality standards.[43]

The risk assessments published by the EPA are intended to provide the States and the public with an easily-obtained usable, accurate, and scientifically-credible source of information on the risks posed by particular contaminants. The risk assessment analyses only provide information; they do not set standards or suggest criteria. Rather, determining appropriate standards is left to the States and local officials. In other words, EPA will be responsible for the process of risk assessment, while the States and local officials will be responsible for risk management.

Risk assessment should be carefully distinguished from risk management. The Committee has used the term as it was defined by the National Academy of Sciences, meaning "the use of the factual base to define the health effects of exposure of individuals or populations to hazardous materials and situations."[44] Risk assessment, in other words, is a technical process which determines only the health consequences of exposures to hazardous materials. In contrast, risk management concerns the policy decision of what to do about the health risks posed by exposure to hazardous materials identified by the risk assessment. Clearly, the choice of policy options depend upon a consideration of many non-scientific values, such as costs, social values, and political concerns.

In conducting a risk assessment, the EPA should use scientifically-sound methodologies to assess the risk to human health and the environment associated with a range of concentrations of the contaminant. The analysis should include the most recent scientific knowledge on the physical, chemcial, biological, and radiological properties of the contaminant and its effects on human health and the environment. The risk assessment analysis should not necessarily be confined to health effects that have been conclusively proven, but should also take into account the potential of a contaminant to cause adverse health effects based on epidemiological data, animal studies, structure-activity relationship analysis, or other similar scientific information.

The analysis should also include an assessment of factors, including contaminant sources, variable aquifer conditions, and ground water uses, which may influence the effect of the contaminant on

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[43] Hearing, *supra; see, e.g.*, testimony of Ms. Roberta Savage, Association of State and Interstate Water Pollution Control Administrators, tr. at 132, 143; Prepared Statement, Mr. Philip C. Metzger, Conservation Foundation, at 5; Prepared Statement, Mr. Charles D. Malloch, Chemical Manufacturers Association, at 8; Testimony, Mr. Donald Middleton, Long Island Association, tr. at 77-78.

[44] National Research Council, *Risk Assessment in the Federal Government: Managing the Process* 3 (1983).

human health and the environment. Effects of a contaminant are frequently controlled by the amount of the contaminant to which individuals, the public, or the environment are exposed. Consequently, State and local officials need to understand the various factors that may affect exposure. Such factors help to identify the risk management choices that could reduce or eliminate threats to human health or the environment.

The analysis should also contain an assessment of the assumptions, scientific uncertainties, and data gaps contained in the risk assessment analyses. Risk assessment is not a perfect science. In many cases, scientists conducting risk assessments must make assumptions which clearly have an impact on the results. In other cases, the lack of available data constrains the risk assessment process. If its limitations are properly understood, however, risk assessment remains a highly useful and valuable tool for policy makers. Clearly setting out those limitations in the risk assessment analysis itself will help policy makers determine how to use the assessment.

Finally, the analysis should contain a comparison of the risks posed by the contaminant to other ground water contaminants. This comparison will assist State and local officials to understand which contaminants pose the greatest threats to health or the environment and to set priorities accordingly.

To help ensure a high level of scientific quality in the risk assessment analyses, EPA is required to seek comment on the analyses from the public and EPA's Science Advisory Board under section 10(c)(2). The Committee also encourages EPA to consult with the Research Committee, scientific and technical organizations, the private sector, and other interested parties to refine EPA's approach to risk assessment.

The amended bill directs the Administrator to use existing data collected by EPA under the environmental laws it administers and by other agencies, particularly the Department of Health and Human Services, to conduct health effects research. Research on the health effects of hazardous substances has expanded in several agencies in the last few years, particularly at the National Institute of Environmental Health Sciences and the National Toxicology Program. Where additional data is necessary to reduce uncertainties in the risk assessment, EPA can use its powers under sections 4 and 8 of the Toxic Substances Control Act to gather additional information. Alternatively, where appropriate, the authority for additional testing contained in section 110 of the Superfund Amendments and Reauthorization Act of 1986 should be used to obtain needed data. This approach would use the scientific and testing capability of National Toxicology Program and the National Institute of Environmental Health Services in concert with the Agency for Toxic Substances and Disease Registry and EPA to determine the potential threat to human health from hazardous ground water contaminants, particularly when such data are not available in a timely manner through the Toxic Substances Control Act.

To promote wider use of the risk assessment analyses, EPA is required to use a standard format for presentation of the risk assessment. EPA is required to publish, with an opportunity for public

notice an comment, risk assessment analyses for at least 30 contaminants within two years, and an additional 30 contaminants within 3 years from the date of the Act. Upon completion of these 60 contaminants, EPA should continue to develop and publish assessments at a rate consistent with the needs of the States, and periodically review and revise existing analyses to reflect developments in scientific understanding.

EPA should ultimately publish a risk assessment analyses for each significant ground water contaminant. Factors that would indicate that a contaminant is "significant" include the prevalence of the contaminant in ground water supplies, the toxicity of the contaminant, the potential for humans to be exposed to the contaminant at hazardous levels, or the potential for the contaminant to cause damage to ecosystems or wildlife. In selecting the contaminants, EPA should consult with the Research Committee. To the extent feasible, EPA should prepare the initial risk assessment analyses for those contaminants which have the highest likelihood of adversely affecting human health or the environment.

G. Technical Assistance, Training and Technology Transfer

Section 9 of the amended bill establishes a general technical assistance, training, and technology transfer program within the Federal government to assist Federal agencies and State and local officials in assessing, managing, monitoring, protecting and remediating ground water resources. The EPA is designated as the lead Federal agency under this Section for source controls, mitigation methods, and health and environmental effects, while the USGS is designated as the lead Federal agency under this section for ground water assessment activities. This division of responsibility accords with the suggestions made by numerous witnesses.[45] While the responsibilities of other Federal agencies are not specified, the Committee anticipates that other agencies, particularly the Department of Agriculture, will participate through the Research Committee in their own programs of technical assistance, training, and technology transfer programs.

This section provides broad and flexible authority for the EPA and the USGS to give assistance to Federal agencies and to State and local governments in managing and protecting ground water resources. Activities authorized by this section include, but are not limited to, assistance in designing ground water monitoring systems, developing ground water classification schemes, developing wellhead protection programs, recommendations for ground water clean up or source control techniques, and assessments of health risks posed by a particular contamination situation.

If requested by a State, EPA and USGS may assist with research or surveys on specific ground water contamination problems, provided that the Federal share of the costs of such project is not greater than 50 percent. The USGS' present Federal/State Cooperative Program under which States agree to share the costs of spe-

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[45] Hearing, *supra; see, e.g.*, Prepared Statement of Mr. Dallas Peck, U.S. Geological Survey, at 5; testimony of Mr. Erik Olson, National Widlife Federation, tr. at 51; Prepared Statement of Mr. Charles D. Malloch, Chemical Manufacturers Association, at 5; Comments of Interstate Conference on Water Policy at 2.

cific USGS research, is consistent with this provision. However, the amended bill provides more flexibility by permitting Federal and State cost-sharing of research which would not be conducted by Federal agency researchers.

The amended bill authorizes EPA and USGS to carry out a training program in disciplines relating to ground water protection and management. As previously discussed, there is a dearth of well-trained personnel in many areas that seriously hinder the ability of State and local governments to develop effective ground water management programs. The amended bill permits the EPA or USGS to charge reasonable fees for the training for non-Federal personnel.

USGS and EPA are also required to carry out an active program of technology transfer to ensure that persons responsible for managing and protecting gound water resources remain well-informed about developments and experiences in the ground water area. For example, EPA should actively disseminate information about feasible and cost-effective prevention or mitigation technologies successfully demonstrated under the program authorized in Section 7. The program should actively search out information in both the private and public sector on topics likely to be helpful to policymakers, such as developments in monitoring and analytical technology, and new information on health or environmental effects. Each agency should designate permanent agency staff whose sole responsibility would be to carry out this technology transfer program. In addition to the dissemination of information through publications and conferences, the staff should respond to individual requests, publish case studies in clear, non-technical language, work on a continuous basis with trade associations and other organizations, and conduct workshops. EPA should consider setting up a ground water technology transfer program within each regional office.

The amended bill includes language to ensure that the information obtained by Federal agencies under the Act would be available to the public, consistent with existing statutes and regulations.

The South Valley of the City of Albuquerque, New Mexico, has experienced significant ground water contamination problems. These problems, which are described in detail in the "South Valley Task Force Final Report" of August 1987, have led to health concerns and well closings. At the same time, Albuquerque has periodically experienced temporary excess water conditions. These problems are similar to those experienced in other parts of the country.

The Committee wants to make clear that the U.S. Geological Survey (USGS) and the Environmental Protection Agency (EPA) have the authority, as part of their other legislative and administrative authorities, to investigate the effects of using excess water supplies and artificial recharge as a means of mitigating ground water contamination problems. The same authority extends to the missions of the State Water Resources Research Institutes as modified by this bill and is complementary to the USGS's and EPA other programs in water resources.

In addition, the Committee notes that the USGS's and EPA's program should be designed, in part, to provide data for State and local water resource managers which will allow them to solve man-

agement problems of the kind being experienced in Albuquerque and elsewhere. Further, the USGS and EPA have the authority to conduct research, development and demonstration programs at sites such as the affected areas of Albuquerque if they believe that the information obtained there may provide information which will be of assistance in the national effort to deal with ground water quality. Finally, the bill provides authority for the USGS and EPA to respond to requests for technical assistance by State and local officials for help in dealing with problems such as those which exists in the South Valley.

The Committee also supports the concept of developing a management model system for the control of aquatic plants and the relationship of surface and ground water quality. The Committee recommends that the Environmental Protection Agency have the responsibility for developing the surface and ground water component of the model system and that the Corps of Engineers have the responsibility for developing the aquatic plant component. The management system is to be usable in surface and ground water ecosystems throughout the United States including Lake Okeechobee, Florida.

H. National Ground Water Information Clearinghouse

Section 10 directs the Secretary to establish a National Ground Water Clearinghouse within one year after enactment of the Act. In accordance with a consensus expressed by witnesses at the hearing, the USGS has been given the lead responsibility for the Clearinghouse.[46] The major purpose of the Clearinghouse is to catalog and disseminate ground water quantity and quality information. As has been noted, many Federal agencies, State and local governments, and private group continue to generate data which is highly relevant to decisions relating to the protection and management of ground water resources. The Clearinghouse will assist in establishing a network of providers and users of information, permitting exchange of information between agencies that generate data.

I. Environmental Protection Agency Ground Water Research Capability Improvements

Section 11 of the amended bill contains a number of provisions from H.R. 2253 which are intended to enhance the capability of the EPA to conduct ground water research. Section 11(a) is intended to clarify EPA's authority to enter into contracts or cooperative agreements or to make grants, to construct necessary facilities, and to use other Federal facilities, for the purposes of carrying out the ground water research activities authorized by the amended bill.

Section 11(b) requries EPA to establish a ground water research committee within EPA. As noted in the Science Advisory Board report on the EPA's ground water research program, ground water research needs are identified only as separate, uncoordinated parts of programs with other responsibilities. While EPA has made some effort to integrate the ground water research program, testimony

[46] Hearing, *supra; see, e.g.*, Prepared Statement of Mr. Charles D. Malloch, Chemeical Maufacturers Assocation, at 9; Prepared Statement of Ms. July Campbell Bird, Environmental and Energy Study Institute, at 11-12.

indicates that ground water research still lacks an adequate mandate within the agency.[47] The Committee concurs with the Science Advisory Board's view that a specific ground water research committee is necessary to ensure a strong ground water research program. A separate ground water research committee, divorced from the immediate demands of the EPA regulatory programs, is also more likely to take into account the research needs of State and local governments.

Section 11(c) directs the Science Advisory Board to review the EPA ground water research program on a continuing basis and to submit periodic reports to Congress. The reports should include the Science Advisory Board's evaluation of the program, including an assessment of the adequacy of resources available for the research program. As previously noted, the Science Advisory Board is also permitted an opportunity to comment on the ground water contaminant risk assessment analyses prepared by the Agency, although such comment should not delay meeting the timetable set out in Section 8.

The Administrator is authorized to establish and maintain research followships in EPA and at public or nonprofit private educational institutions or research organizations. Such a program, advocated by witnesses, would both enhance EPA's internal research capability and contribute to the training of urgently-needed scientists in fields related to ground water protection and management.[48]

Section 11(e) authorizes the Administrator to make grants to institutions of higher learning or other research institutes (or consortia of such institutions) to establish and operate ground water research institutes in the United States. The program is modeled on a similar provision enacted by Congress in Section 209 of the Superfund Amendments and Reauthorization Act of 1986 for hazardous waste research institutes. The bill sets out requirments for eligibility, procedures for application, selection criteria, funding limitations, review and evaluation, and other provisions substantially similar to the Superfund program.

Research which will assist in the protection and management of ground water will require a truly interdisciplinary effort and the full participation of academia. While ground water research is presently being supported by the USGS and USDA at Water Resources Research Institutes located at state land-grant colleges, there is a need to supplement that program with funding that could be made available to private universities, public universities which are not land-grant colleges, and other research institutions.

The amended bill establishes one of the ground water research institutes at EPA's existing National Center for Ground Water Research Center, a consortium between Oklahoma University, Oklahoma State University, and Rice University. This designation is intended to make clear that the status of the National Center would not change under the bill. While the Center would not be required

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[47] Hearing, *supra*, Prepared Statement of Mr. Jay H. Lehr, National Water Well Association, at 4.

[48] Hearing, *supra*, Prepared Statement of Mr. Jay H. Lehr, National Water Well Association, at 5.

to go through the application process set out in the bill, it would be subject to the review and evaluation procedrues set out in the bill, which are similar to EPA's current procedures. The Committee has been impressed with the quality of the work of the National Center, which has worked closely with EPA's ground water laboratory in Ada, Oklahoma. Given the substantial existing investment both in facilities and in personnel, the Committee directs EPA to carry out this Act using existing facilities and research centers until such time as sufficient additional funding is available to support new institutes or facilities without reducing funding for existing facilities.

J. Peer Review

Section 12 requires that all studies, reports and results of research conducted under this Act be subject to appropriate peer review before being adopted or reported. The peer review requirement is intended to help ensure that the information which is made available to ground water managers is of high scientific quality, to ensure that decisions made based on the information will be sound. Similarly, protocols developed in the assessment program set out in Section 6 should be scientifically valid to ensure the quality and integrity of the date being collected. The Committee expects the EPA's Science Advisory Board to make recommendations for proposals to implement this section.

K. Authorization of Appropriations

The amended bill authorizes to be appropriated to the Environmental Protection Agency $3 million in fiscal year 1988, $6.3 million in fiscal year 1989 and $9.9 million fiscal year 1990, in addition to such other sums as may be appropriated. The funding levels represent approximately a ten percent per year increase over the FY 87 base level of $30 million for EPA ground water research. The Committee has not addressed funding which may be necessary for other agencies, including the USGS and USDA, for carrying out their responsibilities under this Act.

V. SECTIONAL SUMMARY OF THE BILL

Section 1. Short Title and Table of Contents. The bill is titled, "National Ground Water Research and Protection Assistance Act of 1987."

Section 2. Findings. This section sets out 14 findings which state: that ground water is a valuable resource threatened by diverse sources of contamination; that the primary responsibility for protecting and managing ground water lies with the States, and that the Federal role should be one of research and technical assistance; that there remain significant gaps in our scientific knowledge about ground water contamination; that current Federal research efforts are uncoordinated and inadequate; that the lack of information hinders States in protecting ground water; that ground water prevention is preferable to clean-up; and that greater efforts are needed to preserve and protect ground water.

Section 3. Definitions.

Section 4. Purposes. This section sets out the purposes of the Act as: (1) establishing a comprehensive and coordinated interagency Federal ground water research program; (2) providing incentives for developing new technologies for protecting and cleaning up ground water; (3) authorizing research at the EPA and USGS; (4) enhancing research capabilities of the EPA; (5) improving knowledge of ground water quality conditions and trends; (6) providing for technical assistance to States to support State and local ground water protection programs; and (7) providing training in relevant disciplines.

Section 5. Coordination of Federal Interagency Ground Water Research Programs. Subsection (a) requires the President to coordinate Federal ground water research programs by establishing an Interagency Ground Water Research Committee to be co-chaired by EPA and USGS. Subsection (b) sets out the duties of the Research Committee. Subsection (c) requires the Research Committee to submit an biannual report to Congress. Subsection (d) requires each member of the Research Committee to enter into formal written agreements setting out respective duties under the overall research program.

Section 6. National Ground Water Assessment Program. Section 6 designates the USGS as the lead Federal agency for activities under this section. USGS is required to submit a report to Congress within one year on the adequacy, utility and accessibility of present ground water information systems and federal data collection and monitoring programs, and to make recommendations for improvements. USGS is required to establish a National Ground Water Assessment Program to assist Federal, State and local governments in assuring that they have information to assess ground water resources for the purposes of protecting and managing ground water resources. The Program includes assistance to State and local governments, development of recommended protocols and data collection methods and the improvement of knowledge on ground water contamination.

Section 7. National Research, Development, and Demonstration Program for Ground Water Protection and Management. Section 7 designates EPA as the lead Federal agency for activities under this section. Section 7 establishes a research program at EPA to support its regulatory responsibilities and to assist States in protecting, managing, and cleaning up ground water. In addition, section 7 establishes a demonstration program for promising new technologies which could be used to control sources of ground water contamination or clean up ground water contamination, modeled after a similar program in the Superfund Amendments and Reauthorization Act of 1986. Subsections (c) through (k) set out procedures for applications, eligibility, and selection processes.

Section 8. Ground Water Contaminant Risk Assessment Analysis. Section 8 requires EPA to conduct and publish a risk assessment analyses for each significant ground water contaminant. The risk assessments would use scientifically-sound methodologies to assess the risk to human health and the environment posed by ground water contaminants. The analyses must be published in a format to facilitate their use by State and local officials and the public. EPA is directed to use information from other agencies, in-

cluding the Department of Health and Human Services and to use existing authority (particularly TSCA) to gather additional data needed to reduce scientific uncertainties in the risk assessments. EPA is required to publish analyses for 30 contaminants in 2 years, and an additional 30 contaminants within 3 years.

Section 9. Technical Assistance, Training, and Technology Transfer. Section 9 directs EPA and USGS to provide technical assistance to State, to train State and local personnel, and to transfer technology and disseminate information. USGS has the lead on characterization activities, while EPA has the lead on source controls, mitigation techniques, and health and environmental effects. Subsection (f) ensures that information obtained by the agencies under the Act is public, consistent with existing disclosure laws.

Section 10. National Ground Water Information Clearinghouse. Section 10 directs USGS to establish a national clearinghouse to catalog and disseminate ground water information.

Section 11. EPA Ground Water Research Capability Improvements. Section 11 contains several provisions to enhance EPA's internal capability to conduct ground water research. Subsection (a) clarifies EPA's authority to make grants, construct facilities, and use other Federal labs, for carrying out this Act. Subsection (b) requires EPA to establish a centralized ground water research committee within EPA. Subsection (c) requires EPA's independent Science Advisory Board to review EPA's ground water research program and periodically report to Congress. The SAB is also directed to comment on the risk assessment analyses prepared by EPA under section 8. Subsection (d) gives EPA the authority to establish research fellowships. Subsection (e) directs EPA to establish university-based, interdisciplinary ground water research centers, including the existing EPA-funded National Center for Ground Water Research, and includes criteria for funding, selection, and periodic review and evaluation.

Section 12. Peer Review. Section 12 is a new section, requiring studies and research conducted under this Act to be subject to appropriate scientific peer review to ensure the quality and the integrity of the data.

Section 13. Authorization of Appropriations. Authorizes, in addition to such other sums as may be appropriated, $3 million in fiscal year 1988, $6.3 million in fiscal year 1989, and $9.9 million in fiscal year 1990 to the EPA for carrying out the Act.

VI. CONGRESSIONAL BUDGET ACT INFORMATION

The bill provides for new authorization rather than new budget authority and consequently the provisions of section 308(a) of the Congressional Budget Act of 1974 are not applicable.

VII. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

Pursuant to section 403 of the Congressional Budget Act of 1974 and Rule XI, Clause 2(l)(3) of the Rules of the House of Representatives, the report of the Congressional Budget Office follows:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC., September 30, 1987.

Hon. ROBERT A. ROE,
Chairman, Committee on Science, Space, and Technology,
House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 791, the National Ground Water Research and Protection Assistance Act.

If you wish further details on this estimate, we will be pleased to provide them.

With best wishes,
Sincerely,

EDWARD M. GRAMLICH,
Acting Director,

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 791.

2. Bill title: National Ground Water Research and Protection Assistance Act of 1987.

3. Bill status: As ordered reported by the House Committee on Science, Space, and Technology, September 29, 1987.

4. Bill purpose: This bill would require the federal government, primarily through the United States Geological Survey (USGS) and Environmental Protection Agency (EPA), to perform certain activities related to the study and management of the nations groundwater resources. Among other things, the bill would authorize an interagency ground water research committee, co-chaired by the EPA and the USGS, to coordinate federal ground water programs. The bill would require the USGS to study and establish a ground water assessment program, and a clearinghouse for ground water information. Under the bill, the EPA would be responsible for establishing demonstration projects, conducting risk assessments, and implement an improvement program that includes grants for ground water research institutes. The bill would authorize appropriations to the EPA of $3 million, $6.3 million, and $9.9 million in fiscal years 1988, 1989, and 1990, respectively.

5. Estimated cost to the Federal Government:

[By fiscal year, in millions of dollars]

	1988	1989	1990	1991	1992
Authorization level:					
Specific	3	6	10		14
Estimated	10	9	14	14	
Total	13	15	24	14	14
Estimated outlays	12	14	21	17	15

The costs of this bill fall within budget function 300.

Basis of estimate: This estimate assumes that the full amounts authorized would be appropriated for each fiscal year. The estimated outlays are based on historical spending patterns for these types

of activities. The specific authorization levels shown in the table above are those stated in the bill for EPA.

This table also contains an estimate of the costs to the USGS of performing the activities required in the bill. Based on information provided by the USGS, CBO estimates that these activities would require appropriations of $10 million in 1988, $9 million in 1989, and $14 million in each of fiscal years 1990, 1991 and 1992; these are shown as the estimated authorization levels in the table above. This estimate includes the costs of studying and establishing the ground water assessment program, establishing the ground water information clearinghouse, and providing technical assistance to other organizations.

6. Estimated cost to State and local governments: None.

7. Estimate comparison: None.

8. Previous CBO estimate: CBO has previously prepared estimates for other versions of H.R. 791. These include an estimate prepared on May 7, 1987 for H.R. 791, as order reported by the House Committee on Interior and Insular Affairs, May 6, 1987; an estimate prepared on September 29, 1987 for H.R. 791, as ordered reported by the House Committee on Energy and Commerce, September 22, 1987; and an estimate on September 30, 1987 for H.R. 791, as ordered reported by the House Committee on Public Works and Transportation, September 23, 1987.

9. Estimate prepared by: Michael Sieverts and Deb Reis.

10. Estimate approved by: C.G. Nuckols (for James L. Blum, Assistant Director, for Budget Analysis).

VIII. OVERSIGHT FINDINGS AND RECOMMENDATIONS, COMMITTEE ON GOVERNMENT OPERATIONS

No findings or recommendations on oversight activity pursuant to Rule X, clause 2(b)(2), and Rule 2(l)(3)(D), of the Rules of the House of Representatives have been submitted by the Committee on Government Operations for inclusions in this report.

IX. EFFECT OF LEGISLATION ON INFLATION

In accordance with Rule XI, clause 2(l)(4) of the Rules of the House of Representatives, this legislation is assessed to have no inflationary effect of prices and costs in the operation of the national economy.

X. COMMITTEE RECOMMENDATION

A quorum being present, the Committee favorably reported the bill H.R. 791 as amended by voice vote, and recommends its enactment.

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